DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2005

WEDNESDAY, APRIL 21, 2004

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:08 a.m., in room SD–192, Dirksen Senate Office Building, Hon. Ted Stevens (chairman) presiding.

Present: Senators Stevens, Cochran, Shelby, Burns, Inouye, Dorgan, and Feinstein.

DEPARTMENT OF DEFENSE

MISSILE DEFENSE AGENCY

STATEMENT OF LIEUTENANT GENERAL RONALD T. KADISH, U.S. AIR FORCE, DIRECTOR, MISSILE DEFENSE AGENCY

OPENING STATEMENT OF SENATOR TED STEVENS

Senator STEVENS. Good morning, General Kadish. We're pleased to have you here. Pardon me for being a few minutes late.

This is your 5th year before us, General, and we think you've done a tremendous job in helping to secure a reliable missile defense system for our Nation. You've provided the leadership and vision to achieve that goal and we're grateful and thankful for your service. And I'm pleased that I've been able to travel with you and to understand your plans. We know this is your last appearance before the subcommittee and we do wish you the very best in whatever your endeavors may be. But just keep in mind, my friend, my first father-in-law said that the English language is the only language in which retire means other than go to bed.

On December 16, 2002, President Bush stated the Department of Defense (DOD) shall proceed with plans to deploy a set of Initial Missile Defense capabilities beginning in 2004. By the end of this year the United States will in fact have Initial Ballistic Missile Defense capabilities and we're proud that you chose Alaska to have a role in that development. Having such a system will hopefully mean that we'll never have to use it in the future. So we look forward to hearing about what you've done to date and to giving us an update on the overall Missile Defense program that you have fashioned and led so well.

Before I open, let me turn to my colleague, my co-chairman for his remarks.

STATEMENT OF SENATOR DANIEL K. INOUYE

Senator INOUYE. I thank you very much. I wish to associate myself with the remarks of the Chairman and to say to General Kadish I thank you very much for your tireless dedication to your country, to the Missile Defense program, and DOD. I wish to congratulate you and best wishes on your future endeavors. Thank you, sir.

May I have the rest of the statement made part of the record?

Senator STEVENS. Without objection, so ordered.

[The statement follows:]

PREPARED STATEMENT OF SENATOR DANIEL K. INOUYE

Today I am pleased to join our chairman in welcoming to the committee Lieutenant General Ronald T. Kadish, Director of the Missile Defense Agency.

General, I understand that this will be your last time testifying before us. You have held this position for nearly five years—much longer than most agency Director tours. You have certainly demonstrated your tremendous dedication and stamina, and I thank you for your tireless dedication to the missile defense program, to the Department of Defense, and to our country—congratulations and best wishes on your upcoming retirement.

Through your five years of service, General, you understand better than anyone that missile defense is a program of great interest to many, and one with plenty of controversy.

This September the Department plans to deploy a limited national missile defense system. This is an exciting achievement following decades of work in the field. Some of your critics, however, argue that the system is not yet ready, and more operational testing needs to be done to ensure that this limited system actually works. I look forward to hearing your response to these critics during our discussions today.

Missile defense is, by its very nature, a complex program. Despite successes in recent tests—and for that I commend you—there are still many technological hurdles to overcome, and much work remains to be done.

This year's budget request continues the growth we have seen in recent years for the missile defense programs. Over $10 billion is in the President's budget for missile defense activities, an increase of $1 billion over last year's appropriation. Sustaining this magnitude of increases in the out-years will be challenging.

Despite these challenges, the missile defense program is one of the most critical national security issues of today and for the foreseeable future. The ballistic missile threat to the United States, to our troops deployed overseas, and to our allies and friends around the world will continue to proliferate.

This committee understands the importance of a strong missile defense to our national security, and we will do our best to continue to support your efforts. Nevertheless, given the risks and rising costs of this program we will remain ever vigilant in our oversight.

General, I look forward to our discussions today on the fiscal year 2005 budget request and the priorities and challenges of the missile defense program.

Senator STEVENS. Senator Shelby.

STATEMENT OF SENATOR RICHARD C. SHELBY

Senator SHELBY. Mr. Chairman, I just want to echo what you and Senator Inouye have said about General Kadish. He served with great distinction and he served in this post for 5 years. That's extraordinary, General, and we wish you the best and we all hope to see you before you actually retire.

Senator STEVENS. Senator Cochran.

Senator COCHRAN. Senator Burns was here before I was.

Senator STEVENS. He's a stealth Senator. Senator Burns.

STATEMENT OF SENATOR CONRAD BURNS

Senator BURNS. The day I become a stealth, that will become a great day. Thank you, Mr. Chairman. I just want to offer my statement for the record today, and I also want to associate my words with the chairman. General Kadish, we have traveled together and 5 years is a long time, especially in the work that you were doing and you've done it well. I don't know what you're going to do in retirement and you know what? I don't care. But we hope it's, you know, the last, General Fogelman retired, you know, why, he thought he went from chief, you know, he's got one of the great businesses there is in Southwestern Colorado. And he's really enjoying it very much; Ron's Johns. So retirement means many things to many people. But I will tell you we see him every now and again and we want to continue to see you around here every now and again too, because we rely on your advice and your good sense about this very important issue. So feel free to drop by any time and if you're going to retire, why, just have a great retirement.

[The statement follows:]

PREPARED STATEMENT OF SENATOR CONRAD BURNS

General Kadish, it appears you have come to brief this Committee on the Missile Defense Agency budget for the last time. Thank you for your service to our great Nation. You have been critical to the continuing success of the Missile Defense Agency. I wish you luck in your future endeavors.

I read daily of our forces in the field using American ingenuity to develop unconventional solutions to solve problems they face. I appreciate your efforts to pursue innovation in technology, acquisition processes, and deployment strategy, to meet the challenges of the evolving ballistic missile threat.

As we move into the phase of what you are calling "Initial Defensive Operations", to provide an initial capability to defeat an incoming ballistic missile threat, I look forward to the growth of this capability to allow us to defeat increasingly complex, and numerous missile threats launched against our homeland, our fleet, and our deployed forces overseas.

The technical challenges you face are formidable, but the stakes are high for our Nation. We must counter the threat of ballistic missile proliferation. I hope you are right in stating that the deployment of the layered missile defense program could persuade rogue states to forego their plans to develop ballistic missiles, but I reserve a sense of skepticism of this possibility.

We centralized missile defense system development with the formation of your agency in DOD to synergize the service solutions, which, at the time, competed for defense dollars within and between the services. I look forward to the layered system that leverages this centralization to develop open architectures, common interfaces, and standardized subsystems, minimize the system operational costs, and increase competition among the Industry providers of these systems.

While I support the flexibility provided by the new acquisition approach, this flexibility brings with it greater exposure to risks. The budgetary classification of the resources within the Missile Defense Agency, which are primarily advanced technology development, do not require the customary depth of oversight, which comes from Defense Acquisition Boards making recommendations to transition between budget resource types. I caution you to be judicious with the resources we provide your agency.

You are developing international partnerships with some of our allies, such as the United Kingdom, Australia, and Japan. I support this effort to share the development burden and benefit with our key allies in the war on terror. They have remained part of our coalition in these difficult times, and our shared values will keep our alliance strong.

Again, I thank you for being here today and look forward to the discussion this morning. Thank you.

Senator STEVENS. Senator Cochran.

Senator COCHRAN. Mr. Chairman, thank you. General Kadish, congratulations to you on your successful tenure as Director of the Missile Defense Agency (MDA). And your skill has been quite obvious in how you have helped mobilize the resources of our Defense Department and our Government to carry out the provisions of the National Missile Defense Act that the Congress passed, and was signed by the President several years ago. We think you've done a magnificent job and we appreciate very much your hard work over this long period of years.

Thank you, Mr. Chairman.

Senator STEVENS. Thank you, Senator.

General, we've all been around the military long enough to know you made a real sacrifice in sticking to this job. You could have moved on and had four stars but you have finished this job and we congratulate you and we admire you and we're thankful that you did it. Thank you, sir.

STATEMENT OF LIEUTENANT GENERAL RONALD T. KADISH

General KADISH. Thank you, Mr. Chairman, Senator Inouye, members of the committee. I would like to express my appreciation for the help of this committee in making the 5 years that I served as the Director of the Missile Defense Agency as productive and pleasant as they have been. My association with this committee has been one of the highlights of my tenure in the Missile Defense Agency, and I'd just like to point out for Senator Burns' benefit that I look at it as leaving active duty, not retiring. But it is a change.

We have made tremendous progress in the Missile Defense Technology Program over the last 5 years and certainly over the last year. And if I might, Mr. Chairman, I'd like to just have a very brief statement this morning and I'd like for my full statement to be entered into the record, if you so choose.

Our direction from the President and the Congress is to develop the capability to defend the United States, our allies and friends and deployed forces against all ranges of missiles in all phases of flight. And I'm pleased to report today that we're on track to do that just this year.

Beginning in 2001, we proposed building over time, a single integrated ballistic missile defense system of layered defenses, and we structured the program to deal with the enormity and the complexity of that task. Our budget request allows us to continue our aggressive research and development effort to design, build and test elements of the system in an evolutionary way, and it provides for modest fielding over the next several years.

With an evolutionary capability based acquisition approach and our aggressive research, development, test and evaluation (RDT&E) program we can put capability into the field, we can test it, we can train with it, we can get comfortable with it, we can learn what works well and what does not and improve it as soon as we can. That is, in a nutshell, what our program does.

We are working routinely with Admiral Ellis from STRATCOM and the war-fighting community. Once the system is placed on alert we'll continue to conduct tests to gain even greater confidence in the operational capability that we have. We are working very

closely with Mr. Christie and the operational test community. The thousands of tests we have conducted in the air, on the ground and in the laboratory with our modeling and simulations help identify problems so we can fix them and highlight any problems so we can address them directly.

The RDT&E program is working. We are focused on the development of the most promising near-term elements, namely the ground-based midcourse and Aegis ballistic missile defense (BMD). But the Terminal High Altitude Area Defense, or THAAD, is progressing very well and will add capabilities to engage in the late midcourse and terminal layers very soon.

In this budget we increased the investment and development of the boost phase layer, which we believe can offer a high payoff improvement to the system. Two program elements, the Directed Energy Laser Program and the Kinetic Energy Interceptor Program for hit-to-kill capability, represent parallel paths and complement each other.

Mr. Chairman, Senator Inouye, thanks to the tens of thousands of talented and dedicated people across this country, America's missile defense program is on track. The Missile Defense Agency is doing what we told the Congress we would do, and your support, in particular this committee's support, has been critical to the progress we've made.

PREPARED STATEMENT

Thank you, Mr. Chairman, and I'm ready to answer any questions you might have.

[The statement follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL RONALD T. KADISH

Good morning, Mr. Chairman, Members of the Committee. It is an honor to be here today to present the Department of Defense's fiscal year 2005 Missile Defense Program and budget.

Today, I would like to outline what we are doing in the program, why we are doing it, and how we are progressing. I also will address why we proposed taking the next steps in our evolutionary development and fielding program. Then I want to emphasize the importance of the acquisition strategy we are using and close with some observations about testing and the Department's approach to Missile Defense Agency (MDA) management.

Our National Intelligence Estimates continue to warn that in coming years we will face ballistic missile threats from a variety of actors. The recent events surrounding Libya's admission concerning its ballistic missile and weapons of mass destruction programs remind us that we are vulnerable. Ballistic missiles armed with any type warhead would give our adversaries the capability to threaten or inflict catastrophic damage.

Our direction from the President is to develop the capability to defend the United States, our allies and friends, and deployed forces against all ranges of missiles in all phases of flight. This budget continues to implement that guidance in two ways.

First it continues an aggressive Research, Development, Test and Evaluation (RDT&E) effort to design, build and test the elements of a single Ballistic Missile Defense (BMD) system in an evolutionary way. Second, it provides for modest fielding of this capability over the next several years.

We recognize the priority our nation and this President ascribe to missile defense, and our program is structured to deal with the enormity and complexity of the task. The missile defense investments of four Administrations and ten Congresses are paying off. We are capitalizing on our steady progress since the days of the Strategic Defense Initiative and will present to our Combatant Commanders by the end of 2004 an initial missile defense capability to defeat near-term threats of greatest concern.

Layered defenses help reduce the chances that any hostile missile will get through to its target. They give us better protection by enabling engagements in all phases of a missile's flight and make it possible to have a high degree of confidence in the performance of the missile defense system. The reliability, synergy, and effectiveness of the BMD system can be improved by fielding overlapping, complementary capabilities. In other words, the ability to hit a missile in boost, midcourse, or terminal phase of flight enhances system performance against an operationally challenging threat. See Chart 1.

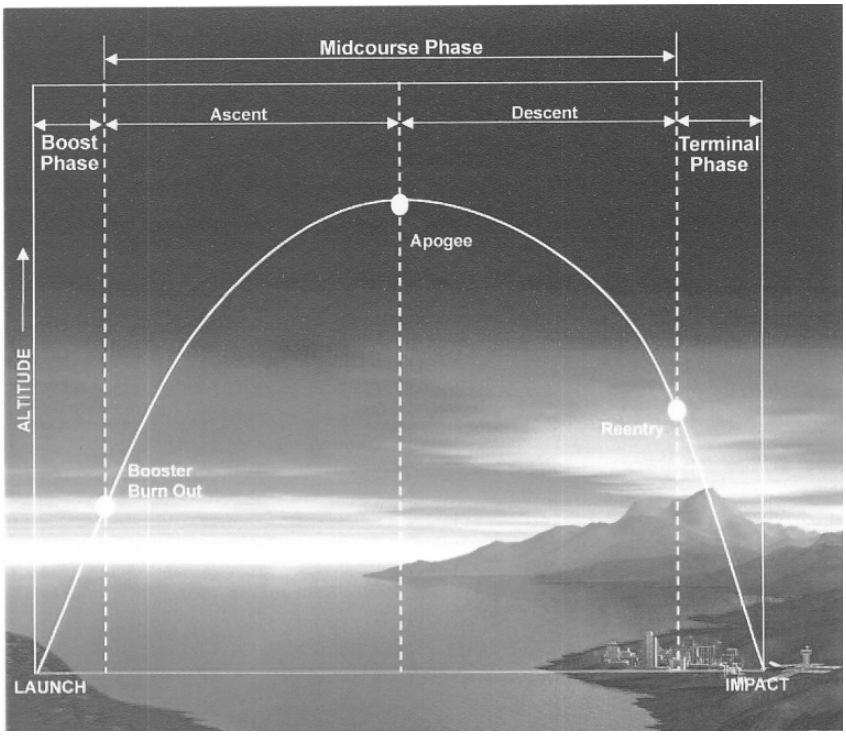

CHART 1.—BMD System Engagement Phases

All of these layered defense elements must be integrated. And there must be a battle management, command and control system that can engage or reengage targets as appropriate. And it all must work within a window of a few minutes. We believe that a layered missile defense not only increases the chances that the hostile missile and its payload will be destroyed, but it also can be very effective against countermeasures and must give pause to potential adversaries.

So, beginning in 2001 we proposed development of a joint, integrated BMD system. Yet such unprecedented complexity is not handled well by our conventional acquisition processes. At that time, the Services had responsibility for independently developing ground-based, sea-based, and airborne missile defenses. The Department's approach was element- or Service-centric, and we executed multiple Major Defense Acquisition Programs (MDAPs).

Today, as a result of defense transformation and a streamlined process instituted by the Secretary of Defense in 2001 to enhance overall integration, we are managing the BMD system as a single MDAP instead of a loose collection of Service-specific autonomous systems. We have come to understand over the years, though, that no one technology, defense basing mode, or architecture can provide the BMD protection we need. Redundancy is a virtue, and so we established a system-centric approach involving multiple elements designed, developed, and built with full integration foremost in our minds. When we made this change, we instituted a "capability-

based" acquisition process instead of a "threat-based" process. Let me explain why this is important.

Most defense programs are developed with a specific threat—or threats—in mind. Twenty years ago, the ballistic missile threat was pretty much limited to Soviet intercontinental ballistic missiles (ICBMs) and sea-launched ballistic missiles. But today we have to consider a wide range of missile threats posed by a long list of potential adversaries. And those threats are constantly changing and unpredictable. Our potential adversaries vary widely in their military capabilities and rates of economic and technological development. Many of them have a tradition of political instability.

Weapon systems developed using a threat-based system are guided and governed by Operational Requirements Documents (ORDs). These documents establish hard thresholds and objectives for the development and deployment of every component. ORDs may be entirely appropriate for most development programs because they build linearly on existing systems. For example, aircraft program managers understand lift and thrust from previous programs going all the way back to the Wright brothers.

Not so for missile defense. Most missile defense development takes place in uncharted waters. Any ORD developed for an integrated, layered missile defense system would be largely guesswork. ORDs rely on very precise definitions of the threat and can remain in effect for years, making this process all the more debilitating for the unprecedented engineering work we are doing. The reality that we may have to introduce groundbreaking technologies on a rapid schedule and also deal with threats that are unpredictable render the threat-based acquisition structure obsolete.

A capability-based approach relies on continuing and comprehensive assessments of the threat, available technology, and what can be built to do an acceptable job, and does not accommodate a hard requirement that may not be appropriate.

Perhaps the most telling difference between the two acquisition approaches is that our capabilities to perform are updated every four to eight months to reflect and accommodate the pace of our progress. We are no longer compelled to pursue a one hundred percent solution for every possible attack scenario before we can provide any defense at all. We are now able to develop and field a system that provides some capability that we do not have today with the knowledge that we will continue to improve that system over time. We call this evolutionary, capability-based development and acquisition.

INITIAL DEFENSIVE CAPABILITY—THE BEGINNING

On December 16, 2002, President Bush directed that we begin fielding a missile defense system in 2004 and 2005. The President's direction recognizes that the first systems we field will have a limited operational capability. He directed that we field what we have, then improve what we have fielded. The President thus codified in national policy the principle of Evolutionary, Capability-Based Acquisition and applied it to missile defense.

The President's direction also builds on the 1999 National Missile Defense Act. Under this Act, deployment shall take place "as soon as technologically possible." The fact is that ballistic missile defense has proven itself technologically possible. Not only have most of the well-publicized flight tests been successful, but so have the equally important computer simulations and software tests. Those tests and upgrades will continue for a long time to come—long after the system is fielded and long after it is deemed operational. After all, this is the heart of evolutionary, capability-based acquisition. This is not a concept designed to trick or mislead. It is simply the logical response to the following question: Defenseless in the face of unpredictable threats, which would we rather have—some capability today or none as we seek a one hundred percent solution?

When we put the midcourse elements (GMD and Aegis BMD) of the BMD system on alert, we will have a capability that we currently do not have. In my opinion, a capability against even a single reentry vehicle has significant military utility. Even that modest defensive capability will help reduce the more immediate threats to our security and enhance our ability to defend our interests abroad. We also may cause adversaries of the United States to rethink their investments in ballistic missiles. Because of this committee's continued support we will have some capability this year against near-term threats.

I must emphasize that what we do in 2004 and 2005 is only the starting point—the beginning—and it involves very basic capability. Our strategy is to build on this beginning to make the BMD system increasingly more effective and reliable against current threats and hedge against changing future threats.

We have made significant strides towards improving our ability to intercept short-range missiles. Two years ago we began sending Patriot Advanced Capability 3 (PAC–3) missiles to units in the field. Based on the available data, the Patriot system, including PAC–3, successfully intercepted all threatening short-range ballistic missiles during Operation Iraqi Freedom last year. Today, it is being integrated into the forces of our allies and friends, many of whom face immediate short- and medium-range threats. We believe it is the only combat-tested missile defense capability in the world.

This year we are expanding our country's missile defense portfolio by preparing for alert status a BMD system to defend the United States against a long-range ballistic missile attack. Chart 2 provides a basic description of how we could engage a warhead launched against the United States.

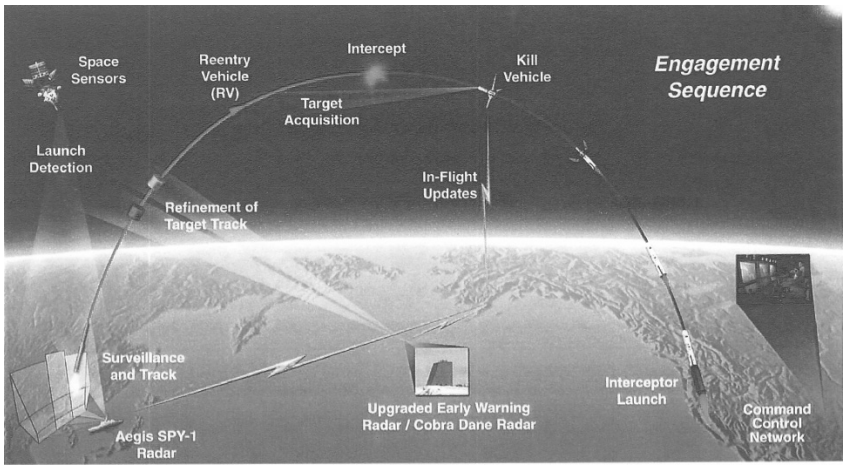

CHART 2.—Engagement Sequence

Last year, we made it clear that this initial capability would be very basic if it were used. We also emphasized that instead of building a test bed that might be used operationally, we would field more interceptors and have them available for use while we continue to test. Because the test bed provides the infrastructure for this initial capability, the additional budget request for the twenty Block 2004 interceptors and associated support was about $1.5 billion in fiscal year 2004 and fiscal year 2005.

Forces to be placed on alert as part of the initial configuration include up to 20 ground-based interceptors at Fort Greely, Alaska and Vandenberg AFB, an upgraded Cobra Dane radar on Eareckson Air Station in Alaska, and an upgraded early warning radar in the United Kingdom. We are procuring equipment for three BMD-capable Aegis cruisers with up to ten SM–3 missiles to be available by the end of 2005. The Navy is working very closely with us on ship availability schedules to support that plan. Additionally, ten Aegis destroyers will be modified with improved SPY–1 radars to provide flexible long-range surveillance and track capability of ICBM threats by the end of 2005, with an additional five destroyers with this capability by 2006, for a total of 15 Aegis BMD destroyers and three Aegis BMD cruisers.

The fiscal year 2005 request funds important for Block 2006 activities to enhance those capabilities and system integration, which I will discuss in a moment.

The Missile Defense Agency, the Combatant Commanders, the Joint Staff, the Military Services, and the Director, Operational Test and Evaluation (DOT&E) are working together to prepare for Initial Defensive Operations (IDO). Using the core capability provided by Ground-based Midcourse Defense (GMD) and augmenting it with the appropriate Command, Control, Battle Management and Communications (C^2BM/C) infrastructure between Combatant Commanders and exploiting the Aegis contribution in a surveillance and track mode, we have created an initial capability from which we can evolve.

Our current fielding plans have been built on the Test Bed configuration we proposed two years ago and are within 60 days of our schedule. Silo and facility construction at Fort Greely, Alaska and Vandenberg Air Force Base in California is

proceeding well. Preparations at Eareckson Air Station in Shemya, Alaska are on track. Over 12,000 miles of fiber optic cables connecting major communication nodes are in place, along with nine satellite communications links. We are in the process of upgrading the Early Warning Radar at Beale Air Force Base and are well underway building the sea-based X-band radar. Our brigade at Schriever Air Force Base and battalion fire control nodes at Fort Greely are connected to the Cheyenne Mountain Operations Center. The C²BM/C between combatant commanders, so essential to providing situational awareness, is progressing well and is on schedule. Upgrades to the Cobra Dane Radar are ahead of schedule. The Chief of Naval Operations has identified the first group of Aegis ships to be upgraded with a BMD capability, and the work to install the equipment on the first of these ships has begun.

Once the system is placed on alert, we will continue to conduct tests concurrently to gain even greater confidence in its operational capability. Additionally, we plan activities to sustain the concurrent test and operations and support of the system. We are laying in the infrastructure to build, test, sustain, and evolve our system as a part of the capabilities-based approach inherent in our strategy.

An integral working relationship with the warfighter, the BMD system user, is critical to the success of this mission. We are working together to ensure that we field a system that is militarily useful and operationally supportable and fills gaps in our defenses. The support centers we are establishing will provide critical training to commanders in the field. The necessary doctrines, concepts of operation, contingency plans, and operational plans are being developed under the lead of U.S. Strategic Command (USSTRATCOM) and in cooperation with U.S. Northern Command, Pacific Command, European Command, and United States Forces in Korea.

IMPROVING FIELDED CAPABILITY THROUGH EVOLUTIONARY ACQUISITION

The system's evolutionary nature requires us to look out over the next three or four years and beyond in our planning. Although it is not easy, we have laid out a budget and a plan to shape the missile defense operational architecture beyond the Block 2004 initial defensive capability.

In this budget, beginning with Block 2006 we will increase GMD Ground-Based Interceptors (GBIs) and Aegis SM–3 interceptors, deploy new capabilities (such as THAAD), expand our sensor net (with a second sea-based midcourse radar and forward deployable radars), and enhance the C²BM/C system integration. The fiscal year 2005 request begins to fund important Block 2006 activities to enhance existing capabilities and system integration. Our improvement plan is to add up to ten GBIs to the site at Fort Greely and possibly initiate long-lead acquisition of up to ten more for fielding at a potential third site or at Fort Greely. We will continue to augment our sea-based force structure with additional SM–3 interceptors and BMD-capable Aegis-class ships.

Much of this system augmentation effort involves extending and building on capabilities that we have been working on over the past several years, so I am confident that what we are doing is both possible and prudent and in line with our missile defense vision.

The confidence we achieve through our entire test program is reinforced by the fact that many missile defense test articles fielded in the existing test bed are the same ones we would use in an operational setting. Except for interceptors, which are one-time use assets, we will use the same sensors, ships, communications links, algorithms, and command and control facilities. The essential difference between an inherent capability in a test bed and the near-term on-alert capability is having a few extra missiles beyond those needed for testing and having enough trained operators and logistics on hand and ready to respond around the clock. Once we field the system, we will be in a better position, literally, to test system components and demonstrate BMD technologies in a more rigorous, more operationally realistic environment. Testing will lead to further improvements in the system and refinement of our models, and the expansion and upgrades of the system will lead to further testing.

The system we initially will put on alert is modest. It is modest not because the inherent capabilities of the sensors and interceptors themselves are somehow deficient, but rather because we will have a small quantity of weapons. The additional ten missiles for Fort Greely will improve the overall system by giving us a larger inventory. Yet today, and over the near-term, we are inventory poor. Block activities throughout the remainder of this decade will be focused in part on improving the system by delivering to the warfighter greater capabilities with improved performance.

Why is this important? In a defense emergency or wartime engagement situation, more is better. A larger inventory of interceptors will handle more threatening war-

heads. Our planning beyond the Block 2004 initial configuration has this important warfighting objective in mind. There are no pre-conceived limits in the number of weapon rounds we should buy. We will build capabilities consistent with the national security objectives required to effectively deter our adversaries and defend ourselves and our allies.

We also must think beyond the initial defensive capability if we are to meet our key national security objective of defending our friends and allies from missile attack. In Block 2006, we are preparing to move forward when appropriate to build a third GBI site at a location outside the United States. Not only will this site add synergy to the overall BMD system by protecting the United States, but it will put us in a better position to defend our allies and friends and troops overseas against long-range ballistic missiles. For the cost of ten GBIs and associated infrastructure, we will be able to demonstrate in the most convincing way possible our commitment to this critical mission objective. The location of this site is still subject to negotiation with no final architecture defined nor investment committed until fiscal year 2006.

As I have said all along, we are not building to a grand design. We are building an evolutionary system that will respond to our technical progress and reflect real world developments. We added about $500 million to last year's projected fiscal year 2005 budget estimate to begin funding our Block 2006 efforts. As you can see, the system can evolve over time in an affordable way in response to our perception of the threat, our technical progress, and our understanding of how we want to use the system. Yet even as it does evolve, our vision remains constant-to defeat all ranges of missiles in all phases of flight.

TESTING MISSILE DEFENSES—WE NEED TO BUILD IT TO TEST IT

Another key question surrounds the nature of missile defense systems themselves. How do you realistically test an enormous and complex system, one that covers eight time zones and engages enemy warheads in space? The answer is that we have to build it as we would configure it for operations in order to test it. That is exactly what we are doing by building our test bed and putting it on alert this year.

By hooking it all up and putting what we have developed in the field, we will be in a better position to fine-tune the system and improve its performance. Testing system operational capability in this program is, in many ways, different from operational testing involving more traditional weapon systems. All weapon systems should be tested in their operational environments or in environments that nearly approximate operational conditions. This is more readily accomplished for some systems, and is more difficult to do for others.

For example, an aircraft's operational environment is the atmosphere. Similarly, when we conduct rigorous operational tests of our Navy's ships, we do so at sea—in their environment. The BMD system's operational environment is very different. It is a geographically dispersed region that is also a test bed. For both missile defense testing and operations, geography counts. After we have gone through the simulations, the bench tests, and the flybys, we want to test all missile defense parts together under conditions that are as nearly operationally realistic as we can make them—with sensors deployed out front, with targets and interceptors spaced far enough apart to replicate actual engagement distances, speeds and sequences, with communication links established, and with command and control elements in place. We in fact have conducted a number of events that exercise the projected communication and command and control paths required to link elements of the BMD system in what we call "Engagement Sequence Groups," building our confidence that we can combine threat data from different systems across a third of the globe to allow for the engagement of ballistic missiles threats to the entire United States.

One of the key questions that we have to answer is: What is the role of operational testing in an unprecedented, evolutionary, capability-based program? The answer is that the Director, Operational Test and Evaluation, and the Operational Test Agencies play a critical role in missile defense. Since evolutionary, capability-based processes do not fit the traditional ORD-based operational test methodology, we have applied an assessment approach that provides for a continuous assessment of the capabilities and limitations of the BMD system. Since testing is central to our RDT&E program and our operational understanding of the system, we are continuing to modernize and improve our test infrastructure to support more operationally realistic testing.

We are working very closely with Mr. Christie, the DOT&E, and the operational test community. As our tests are planned, executed, and evaluated, the BMD system Combined Test Force, which brings together representatives from across the testing community, is combining requirements for both developmental and operational ca-

pability testing. Wherever possible we are making every test both operationally realistic and developmental. We have been working daily with the appropriate independent operational test agencies (OTA) to ensure they are on board with our objectives and processes. There are approximately 100 operational test personnel embedded in all facets of missile defense test planning and execution who have access to all of our test data. They have the ability to influence every aspect of our test planning and execution.

Now, how much confidence should we have in using this test bed in an alert status? The full range of missile defense testing—from our extensive modeling and simulation and hardware-in-the-loop tests to our ground and flight testing—makes us confident that what we deploy will work as intended. We do not rely on intercept flight tests to make final assessments concerning system reliability and performance. Our flight tests are important building blocks in this process, but the significant costs of these tests combined with the practical reality that we can only conduct a few tests over any given period of time mean we have to rely on other kinds of tests to prove the system. System capabilities assessed for IDO will be based on test events planned for fiscal year 2004 as well as data collected from flight and ground tests and simulations over the past several years.

The missile defense test program helps define the capabilities and limitations of the system. The thousands of tests we conduct in the air, on the ground, in the lab, and with our models and simulations in the virtual world predict system performance and help identify problems so that we can fix them. They also highlight gaps so that we can address them. This accumulated knowledge has and will continue to increase our confidence in the effectiveness of the system and its potential improvements. None of our tests should act as a strict "pass-fail" exercise telling us when to proceed in our development or fielding. We can approximate realistic scenarios, though, after we have put interceptors and sensors in the field and integrated them with our C^2BM/C network.

We conduct other kinds of tests that provide valuable information about the progress we are making and the reliability of the system. Integrated ground tests, for example, are not subject to flight test restrictions and can run numerous engagement scenarios over the course of a few weeks. Our modeling and simulation activity is an even more powerful system verification tool. It is important to understand that in the Missile Defense Program we use models and simulations, and not flight tests, as the primary verification tools. This approach is widely used within the Department, especially when complex weapon systems are involved.

Currently, we have very good models for each one of our system components, and we are able to use these together to run scenarios so that we can understand the environments within which we operate and characterize the margin we have in the system design. Missile defense ground and flight tests anchor the data we produce in our models, which in turn enhance our confidence regarding the operational capability we can achieve, because we can understand the system's behavior in many hundreds of test runs. These models are regularly updated using test data from our ground and flight tests. Over time we are building up our modeling and simulation capability at the system level to approximate more closely the type of end-to-end testing we would like to have to verify that the system is doing what we want it to do.

For example, our modeling and simulation capabilities are very accurate and allow us to mirror the achieved outcome of a flight test. The graphic below provides an example of why we believe our simulation capabilities to be the most powerful tools for projecting the reliability of the initial BMD system. In Figure 1 we have mapped out the predicted performance of the Integrated Flight Test 13B interceptor and matched it up with performance data we collected during the flight. The match up is nearly exact, and it shows that the Exo-atmospheric Kill Vehicle Mass Simulator was very close to the predicted insertion point velocity.

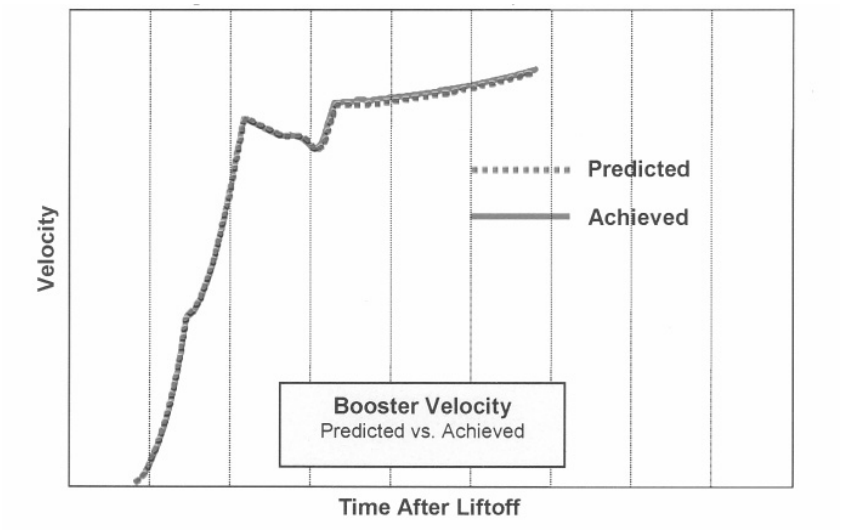

FIGURE 1. Booster Velocity/IFT 13B

Generally, when we deploy a weapon system in a traditional mission area, it is appropriate to conduct initial operational testing to ensure that the replacement system provides a better capability than the existing system. Put another way, there is a presumption that the deployed system should be used until a better capability is proven. In the current situation, where we have no weapon system fielded to defend the United States against even a limited attack by ICBMs, that presumption must be re-examined. With the provision of a militarily useful capability, even if it is limited, it is presumed that the capability can be fielded unless it is determined that operating the initial capability is considered to be an unacceptable danger to the operators, or any other similar reality.

USSTRATCOM will factor in all available test information into its military utility assessment of the fielded condition.

BALLISTIC MISSILE DEFENSE SYSTEM RESEARCH AND DEVELOPMENT PROGRAM

We have requested $7.6 billion in fiscal year 2005 to continue our investment in missile defense RDT&E. Why do we need this level of investment in RDT&E? We need to press forward with our missile defense research and development if we are to improve the system by integrating upgraded or more advanced components and by exploiting new basing modes to engage threat missiles in, for example, the boost phase of flight. We have to lay the RDT&E foundation for evolutionary improvements to the BMD system. We intend to improve the capability of the midcourse phase while adding additional layers.

The RDT&E program is working. The ability to make trade-offs among our development activities has allowed us to focus on the development of the most promising near-term elements, namely, GMD, Aegis BMD and PAC–3. GMD and Aegis BMD make up elements of the midcourse defense layer while PAC–3 provides capability in the terminal layer. The GMD fiscal year 2005 budget request is $3.2 billion; the request for Aegis is $1.1 billion.

In this budget we increase investment in the development of a boost layer. Two program elements, a high energy laser capability and a new kinetic energy interceptor (KEI) or "hit to kill" capability, represent parallel paths and complement each other. Achieving capability in the boost phase as soon as practicable would be a revolutionary, high-payoff improvement to the BMD system. Although the technologies are well known, the engineering and integration required to make them work are very high risk. Therefore, having parallel approaches, even on different timelines, is a very prudent program management approach. We expanded our efforts in the boost phase as soon as we were able after withdrawal from the 1972 Anti-Ballistic Missile (ABM) Treaty, which specifically prohibited boost phase development against long-range missiles.

The Airborne Laser (ABL) program has been in development since 1996. Development of an operational high energy laser for a 747 aircraft is a difficult technical challenge. Although we have had many successes in individual parts of the program, we have not been able to make some of our key milestones over the past year. The last 20 percent of the program effort has proven to be very difficult, and some of the risks we took early in the program have impaired our present performance. Consequently, I reviewed the program late last year and directed a restructure that focused on our near-term efforts, delaying the procurement of the second aircraft until we could gain more confidence in our ability to meet schedules. I have adjusted the resources accordingly.

We no longer plan for ABL to deliver a contingency capability in Block 2004. There have been, nevertheless, several technical accomplishments to date. We have demonstrated the capability to track an ICBM in the boost phase using ABL technologies and improved beam control and fire control technologies. At this time there is no reason to believe that we will fail to achieve this capability. This is such a revolutionary and high payoff capability; I believe we should again be patient as we work through the integration and test activities. But the risks remain high. The fiscal year 2005 budget request is $474 million for ABL.

We undertook the KE boost effort in response to a 2002 Defense Science Board Summer Study recommendation. In December 2003 we awarded the contract for development of the KEI boost effort. This was the first competition unconstrained by the ABM Treaty. It was also the first to use capability-based spiral development as a source selection strategy. The contract requires development of a boost phase interceptor that is terrestrial-based and can be used in other engagement phases as well—including the midcourse and possibly exo-atmospheric terminal phases. In other words, it could provide boost phase capability as well as an affordable, competitive next-generation replacement for our midcourse interceptors and even add a terminal phase capability should it be required. In 2005, we will begin conducting Near-Field Infrared Experiments to get a close-up view from space of rocket plumes to support the development of the terrestrial-based interceptor seeker and provide additional data needed for the development of a space test bed.

We have budgeted about $500 million for the KE boost effort for fiscal year 2005. I believe this funding is necessary for a successful start. Those who would view this amount as a significant increase that is unwarranted for a new effort do not understand the importance of prudent programming and the preparatory work required to make such a program ultimately succeed. There are many examples of an underfunded systems engineering effort, where engineering costs sky-rocketed because adequate upfront work was not done. Mr. Chairman, I urge the committee to look carefully at our proposal and allow us to get a solid start on this essential piece of the layered BMD system.

OTHER BUDGET HIGHLIGHTS

Funding in the fiscal year 2005 request supports the Block 2004 initial configuration as well as activities to place the BMD system on alert. It also lays the foundation for the future improvement of the system. We are requesting $9.2 billion to support this program of work, which is approximately a $1.5 billion increase over the fiscal year 2004 request. The increase covers costs associated with fielding the first GMD, Aegis BMD, sensor, and command, control and battle management installments and will allow us to purchase long-lead items required for capability enhancements in Block 2006.

We have made a successful transfer of the PAC–3 program to the Army and remain convinced that the Department made the right decision in doing so. In the Patriot system, missile defense and air defense are so intertwined that attempting to manage them separately would be difficult if not futile. We continue to believe that the Army is in the best position, given the maturity of the PAC–3, to manage future enhancements and procurements. Meanwhile MDA remains fully cognizant of the Army's efforts and maintains the PAC–3 in the BMD system as a fully integrated element, with interfaces controlled by our configuration management process. PAC–3 is part of our ongoing system development and testing.

The fiscal year 2005 funding request will buy equipment to ramp up the testing of THAAD, which, once fielded, will add endo-atmospheric and exo-atmospheric terminal capabilities to the BMD system to defeat medium-range threats. Terminal High Altitude Area Defense (THAAD) is progressing well and will add capabilities to engage in the late midcourse and terminal layers. THAAD recently completed the Design Readiness Review, and development hardware manufacturing is underway. The fiscal year 2005 budget request is $834 million for THAAD. Delivery of the THAAD radar was completed ahead of schedule and rolled out this month. Flight

testing is scheduled to begin in the first quarter of fiscal year 2005 at White Sands Missile Range, New Mexico.

We will be able to begin assembly and integration of two Space Tracking and Surveillance System (STSS) satellites. The fiscal year 2005 budget request for STSS is $322 million.

We will continue development of the C²BM/C "backbone" to provide real-time sensor-netting to the warfighter for improved interoperability and decision-making capability. Additional BMD system C²BM/C suites and remote capability will be deployed to Combatant Commanders as the system matures.

We also have several Science and Technology initiatives to increase BMD system firepower and sensor capability and extend the engagement battle space of terminal elements. One of our main efforts is to increase BMD system effectiveness in the midcourse phase by placing Multiple Kill Vehicles on a single booster, thus reducing the discrimination burden on BMD sensors. We also are conducting important work on advanced systems to develop laser technology and laser radar, advanced discrimination, improved focal plane arrays, and a high-altitude airship for improved surveillance, communication, and early warning. In support of this, we have requested about $200 million in the fiscal year 2005 budget request for the development of advanced systems.

INTERNATIONAL PARTNERSHIPS

In December 2003, through a formal Cabinet Decision, the Government of Japan became our first ally to proceed with acquisition of a multi-layered BMD system, basing its initial capability on upgrades of its Aegis destroyers and acquisition of the SM–3 missile. In addition, Japan and other allied nations will upgrade their Patriot units with PAC–3 missiles and improved ground support equipment. We have worked closely with Japan since 1999 to design and develop advanced components for the SM–3 missile. This project will culminate in flight tests in 2005 and 2006 that incorporate one or more of these components. These decisions represent a significant step forward with a close ally and we look forward to working together on these important efforts.

We are undertaking major initiatives in the international arena in this budget. Interest among foreign governments and industry in missile defense has risen considerably over the past year. We have been working with key allies to put in place mechanisms that would provide for lasting cooperative efforts.

We will begin in fiscal year 2005 to expand international involvement in the program by encouraging international industry participation and investment in the development of alternative boost/ascent phase element components, such as the booster, kill vehicle, launcher, or C²BM/C. This approach reduces risk, adds options for component evolution for potential insertion during Block 2012, and potentially leads to an indigenous overseas production capability. We intend to award a contract for this effort this year.

In 2003 the United States signed a Memorandum of Understanding on Ballistic Missile Defense with the United Kingdom and an annex enabling the upgrade of the Fylingdales early warning radar. We are continuing our consultations with Denmark regarding the upgrade of the Thule radar site in Greenland. Australia has announced plans to participate in our efforts, building on its long-standing defense relationship with the United States. Canada also has entered into formal discussion on missile defense and is considering a BMD role for the U.S.-Canadian North American Aerospace Defense Command (NORAD). Our North Atlantic Treaty Organization partners have initiated a feasibility study for protection of NATO territory against ballistic missile attacks, which builds upon ongoing work to define and develop a NATO capability for protection of deployed forces.

We are continuing work with Israel to implement the Arrow System Improvement Program and enhance its missile defense capability to defeat the longer-range ballistic missile threats emerging in the Middle East. We are also establishing a capability in the United States to co-produce specified Arrow interceptor missile components, which will help Israel meet its defense requirements more quickly and maintain the U.S. industrial work share. We are intent on continuing U.S.-Russian collaboration and are now working on the development of software that will be used to support the ongoing U.S.-Russian Theater Missile Defense exercise program.

We have other international interoperability and technical cooperation projects underway as well and are working to establish formal agreements with other governments. Our international work is a priority that is consistent with our vision and supportive of our goals.

WORLD-CLASS SYSTEMS ENGINEERING—THE KEY SUCCESS FACTOR

The President's direction to defeat ballistic missiles of all ranges in all phases of flight drove us to develop and build a single integrated system of layered defenses and forced us to transition our thinking to become more system-centric. We established the Missile Defense National Team to solve the demanding technical problems ahead of us and capitalize on the new engineering opportunities created by our withdrawal from the ABM Treaty. The National Team brings together the best, most experienced people from the military and civilian government work forces, industry, and the federal laboratories to work aggressively and collaboratively on one of the nation's top priorities. No single contractor or government office has all the expertise needed to design and engineer an integrated and properly configured BMD system. Let me give a perspective on why the National Team is so important.

What we have accomplished is an unprecedented integration of sensors communications infrastructure, and weapons that cut across Service responsibilities on a global scale. Even our first engagement sequence involves an unparalleled accomplishment.

The BMD system will engage a long-range ballistic missile threat across 9,500 miles. Threat messages sent by an Aegis destroyer will pass this data across eight BMD system communication nodes. System data travels across approximately 48,000 miles of communication lines. The engagement takes place 3,500 from Fort Greely at an altitude of 100 kilometers. At no time in history has there been an engagement performed by detection and weapon engagement systems separated by such distances. Over the past year and a half, we have rapidly built confidence in this weapon engagement capability through the use of proven systems and technologies coupled with robust integrated tests and exercises.

The National Team's job has not been easy. System engineers work in a changed procurement and fielding environment, which in the missile defense world means making engineering assessments and decisions based on technical objectives and goals and possible adversary capabilities rather than on specifications derived from more traditional operational requirements documents. This unified industry team arrangement does not stifle innovation or compromise corporate well-being. There is firm government oversight and greater accessibility for all National Team members to organizations, people, and data relevant to our mission. We accomplished this without abandoning sound engineering principles, management discipline, or accountability practices.

Significant benefits have resulted from this unique approach. Early on, this team brought to the program several major improvements, including: system-level integration of our command and control network; adoption of an integrated architecture approach to deal with countermeasures; development of a capability-requirement for forward-based sensors, such as the Forward Deployable Radar and the Sea-Based X-Band Radar; and identification of initial architecture trades for the boost/ascent phase intercept mission. The National Team also developed and implemented an engagement sequence group methodology, which optimizes performance by looking at potential engagement data flows through the elements and components of the system independent of Service or element biases. If we had retained the traditional element-centric engineering approach, I am doubtful that any one of the element prime contractors would have entertained the idea of a forward-based radar integrated with a "competing" system element. The National Team is central to this program.

RESPONSIBLE AND FLEXIBLE MANAGEMENT

Congressional support for key changes in management and oversight have allowed us to execute the Missile Defense Program responsibly and flexibly by adjusting the program to our progress every year, improving decision cycle time, and making the most prudent use of the money allocated to us.

One of the key process changes we made in 2001 was to engage the Department's top leadership in making annual decisions to accelerate, modify, or terminate missile defense activities. We take into account how each development activity contributes to effectiveness and synergy within the system, technical risk, schedules, and cost, and we then assess how it impacts our overall confidence in the effort. We have successfully used this process over the past three years.

Today's program is significantly different from the program of three years ago. In 2001 and 2002 we terminated Space-Based Laser development in favor of further technology development; restructured the Space-Based Infrared Sensors (Low) system, renaming it the Space Tracking and Surveillance System, to support more risk reduction activities; cancelled the Navy Area program following significant cost overruns; and accelerated PAC–3's deployment to the field. We also proposed a mod-

est beginning in fielding the BMD system and put Aegis BMD and its SM–3 interceptor on track to field.

This year we have restructured the ABL program to deal more effectively with the technical and engineering challenges before us and make steady progress based on what we know. We also decided to end the Russian-American Observation Satellite (RAMOS) project because of rising levels of risk. After eight years of trying, RAMOS was not making the progress we had expected in negotiations with the Russian Federation. So we are refocusing our efforts on new areas of cooperation with our Russian counterparts.

These periodic changes in the RDT&E program have collectively involved billions of dollars—that is, billions of dollars that have been invested in more promising activities, and billions of dollars taken out of the less efficient program efforts. The ability to manage flexibly in this manner saves time and money in our ultimate goal of fielding the best defenses available on the shortest possible timeline.

Such decisive management moves were made collectively by senior leaders in the Department and in MDA. I believe these major changes are unprecedented in many respects and validate the management approach we put in place. The benefits of doing so are clearly visible today. When something is not working or we needed a new approach, we have taken action.

CLOSING

Mr. Chairman, I would like to recognize the many talented and dedicated people across this country who have made, and are continuing to make, our efforts successful. I have met with people from manufacturing facilities, R&D centers, and test centers. I have met with people from many different parts of the world who are working on our international efforts. Our fellow citizens should be proud of the talent, commitment, and dedication that every one of these people provides.

We take our responsibilities very seriously. We have an obligation to the President, the Congress, and the American people to get it right. With the continued strong support of Congress and this committee, we will continue our progress in defending the United States, our troops, and our allies and friends against all ranges of ballistic missiles in all phases of flight.

Thank you, and I look forward to your questions.

Senator STEVENS. Thank you very much. I will turn to Senator Inouye first.

Senator INOUYE. Mr. Chairman, if I may, may I submit my questions?

Senator STEVENS. Yes sir.

Who was first? Senator Shelby.

Senator SHELBY. Yes sir. Thank you.

EXOATMOSPHERIC KILL VEHICLE (EKV) REPAIRS

General, could you give us the progress update on the EKV repairs as we approach IFT–13C.

General KADISH. Yes Senator, I'd be glad to. I'd like to go back in history just a little bit. About 1 year ago we decided that some design changes were needed to both the kill vehicle and our booster to make it better. And that was a result of a number of flight tests that we'd done prior to that time.

Senator SHELBY. What have you learned here?

General KADISH. We've learned, I guess the biggest thing we've learned is, it's pretty hard to make some major changes in less than 1 year. But we've done it. And we made those changes, we put it into the workflow and there's about seven or eight kill vehicles in work right now for the balance of this year. But in the process of doing that we discovered a circuit board that was not manufactured properly. And when we found that particular effort we not only decided to fix that circuit board, which would have taken about 3 or 4 weeks, or a month, of a delay. But we decided that it was in the best interest of quality and mission assurance prac-

tices to go back and put a team of experts—and we put about 40 or 50 people on this effort—and we went through each and every aspect of the design of the kill vehicle, to make sure that we didn't make any of those mistakes that we didn't know about. And we have completed that effort, we are in the process of changing a few things that we found and that has resulted in a little bit more of a delay to the flight tests this year. But I am confident that when we complete that process and we actually do the flight tests we will have done everything we could possibly do to make that kill vehicle work properly.

GROUND-BASED MISSILE DEFENSE (GMD) FUNDING

Senator SHELBY. General, the ground-based midcourse defense segment, the multiple kill vehicle program and the Kinetic Energy Interceptor program I think are very important. In the 2005 funding request it's increased to $9.2 billion, $1.2 billion over 2004. There's some concerns, though, that GMD is underfunded due to greater internal competition for funds. MDA, I believe, must find the proper funding balance to accomplish its goals and beyond for the Ballistic Missile Defense System architecture. I know that you've requested a significant increase in funding for the MDA programs, but I'm concerned about the health of GMD and success there. Are you trying to do too much with too little? I know you never have enough funds. Do you want to speak on that?

General KADISH. Well Senator, that's a problem we deal with every day, internally. And you're right. We never have enough funds for what we would like to do in any program.

Senator SHELBY. Do you have enough funds to meet your GMD development testing and deployment objectives at this point?

General KADISH. We believe when we balance everything out we will have enough resources to do that. I think the GMD part of this is about $3.2 or so billion this year, a little bit less than that next year, and I think we're working on $2 billion the following year. In fact, we've added about $1.5 billion for fiscal year 2004, most of that goes to GMD in the sense of further building out missiles and doing the test program that we need to do. And we'll continue to look at the other aspects of what we need to do and whether it's the multi-kill vehicle or the Kinetic Interceptor (KI) boost or Aegis, and make sure that we do the best we can with the money we have. And so far——

MDA FUNDING

Senator SHELBY. If you had more money it wouldn't hurt anything, would it?

General KADISH. Senator, I'd never turn down more money. But I think it's incumbent on us, internally MDA, to make sure that we get the most out of every dollar that we get. And we're trying to do that, and it's a constant balancing of effort in the process.

Senator SHELBY. Thank you, General.

Senator STEVENS. Senator Burns.

Senator BURNS. General, the Missile Defense Agency's annual budget requests are somewhere between $8 and $10 billion. Does this funding cover only development, and how are the traditional acquisition procurement wedges incorporated with the Ballistic

Missile Defense System? In other words, have you changed anything in there, in that process?

General KADISH. Yes we have, Senator, and the $8 to $10 billion request, at least for 2004, 2005, 2006 and part of 2007 right now includes about anywhere from $1 billion to $2 billion a year of money for fielding equipment. Now, I didn't use the word procurement here because it has very defined meaning in the way the Department talks about procurement money versus RDT&E and so forth. Because the Congress has allowed us to use research and development money, we're able to do very modest procurement or fielding of these types of equipment in the beginning. Now, one of the problems we have with the Missile Defense in general, is trying to fit it into the mold that the Department uses, in that typically we posture a force structure. For instance, we might say that there's a need for 100 or 200 or 300 ground-based interceptors. And we would go and we'd fund those, fully fund them in a procurement account and we'd have a major growth in the overall process. We're not doing that, primarily because it is not clear what mix of interceptors we're going to ultimately need for the threats that we're going to face. So it is a non-standard approach. We're taking it a step at a time. Somewhere in the neighborhood of $1 to $2 billion a year right now is programmed to actually field equipment out of the RDT&E effort and make it better over time, and then when we reach a point where we reach clarity with the threat and how many pieces of the system we need, we'll go ahead and transition to the normal mode. That's the plan that we have.

HIGH ALTITUDE AIRSHIP

Senator BURNS. There was another part of what you're doing that sort of caught my attention too, and that's high altitude airship. I can't help but think that this, if successful, they call it the Airship Advanced Concept Technology Demonstration, you cut back a little bit on its funding but I happen to think that, you know, when we started to talk about space and shuttles and we started talking about reuseables and unmanned reuseables, I think this program has application, both military and commercial, in the civilian end of the world. Is this program adequately funded, do you think, to move forward with this new technology?

General KADISH. Senator Burns, I share your desire for this type of program because I believe it could be a more affordable approach for persistent high altitude and not go to space in some cases. I believe it is adequately funded because there are big risks in making an airship of this nature to fly at the altitudes that we're talking about. So, the program's structured to actually reduce those risks by demonstrating we can do this initially, and if we can demonstrate we're doing it then I wouldn't hesitate to come to you and ask for money to go ahead and take it to the full production of those types of systems. It's so revolutionary that it could be a major change.

Senator BURNS. It sure is, and I think it has spillover into our fuels and the kind of composites and different materials that we'll need. It affords a lot of possibilities for commercial application as well.

General KADISH. It certainly does.

Senator BURNS. Thank you, Mr. Chairman.
Senator STEVENS. Senator Cochran.

BMD FIELDING ACCELERATION

Senator COCHRAN. Mr. Chairman, thank you. General Kadish, I understand that your plans for fielding the Ballistic Missile Defense capability later this year are proceeding and that eight of the planned 20 ground-based interceptors will be available for initial defense operations later this year. Can you give us some specific current time line expectations for this program and whether or not we can help accelerate that with additional funding in your budget request?

General KADISH. Senator, about 1½ weeks ago we went to Huntsville and did what we call 180-day review; 180 days to our planned internal MDA dates that we're using for September. And I came away from that review very encouraged that we were within 30 to 60 days of those schedules right now, and more on the on-time than not being on-time. It's still a major challenge for us over the next 6 months to do this but right now what I see is that we will, in fact, have up to 8 ground-based interceptors by the end of this calendar year and 12 the following year, available for alert capability. As far as accelerating anything, I think we set a few years ago the schedule and we've actually been meeting it fairly well. So I don't see over the next 6 months or even the next 12 months that we're going to be able to accelerate anything over and above the schedules that we have. I think the major success criteria that I'm using is to do it on time, in the process, and as quickly as we set up the schedules a few years ago, because it was a major challenge to accomplish it. So as much as it pains me to say this, but I don't think extra money will accelerate the process. It would help us in other areas but not necessarily in acceleration.

Senator COCHRAN. One of the important——

General KADISH. And I would not recommend trying to accelerate.

SPACE BASED SENSORS—SPACE TRACKING AND SURVEILLANCE SYSTEM (STSS)

Senator COCHRAN. Right. One of the important elements in our Missile Defense System is space-based sensors, terrestrial sensors. In your statement you mention assembling and integrating two space tracking and surveillance system satellites, and I understand that these could be launched in tandem in 2007. What is your view of where this program is headed and how will it contribute to an effective Ballistic Missile Defense?

General KADISH. The space tracking and surveillance system is what we used to call SBRS-Low, and we changed the name because we got confused with SBRS-High, which was a different program, among other things. But the way this would contribute is it would provide a low Earth-orbiting set of satellites to continuously watch for missile launches and once they're launched, track it through the entire phase of flight. If we could do that then our ability to engage those ballistic missiles and warheads and destroy them would be greatly enhanced. I'd like to point out that over the years this program has morphed into different aspects and I think the last count

was that we had 85 separate studies on whether or not to do STSS-like constellations or not. And what we decided to do was to, rather than do another study, was to put two satellites in orbit, get the data that we need to confirm whether or not we're going to be able to make this work as we intended, and then make a decision subsequent to that on whether or not we'll recommend the full constellation of these satellites. We're on track to do just that. And the tandem launch in 2007, the program activity we have to do that, is on schedule and on budget and doing very well.

Senator COCHRAN. Is there any particular risk or high risk associated with the tandem launch?

General KADISH. Well, I wouldn't normally like to do a tandem launch of this type but it is the most efficient use of money and what we found is that if we launched them separately and then we lost one satellite we wouldn't be able to do the mission anyway. Because these are stereo-viewing satellites; you need two of them to accomplish this. So we figured that the tandem launch was the best balance of risk and benefit.

Senator COCHRAN. Mr. Chairman, I have several other questions. I think my time may be expired and I'll reserve my other questions for later in the round.

Senator STEVENS. Senator Feinstein.

PREPARED STATEMENT

Senator FEINSTEIN. Thanks very much, Mr. Chairman. Welcome, General. I know you're under the weather and I don't want to aggravate your condition, so if I could submit my statement for the record I will confine my questions.

[The statement follows:]

PREPARED STATEMENT OF SENATOR DIANNE FEINSTEIN

I believe National Missile Defense is one of the key foreign policy and national security issues that we will face in the coming decades. The Administration's decisions on this issue should be made in a deliberate and thoughtful manner and in close consultation with our allies, and, most importantly, the United States Congress.

Previously, I have stated that my concerns about NMD revolve largely around four issues: the nature of the threat; the implications for arms control and the international security environment; the feasibility of the technology; and the cost.

Given the high cost and the still uncertain and untested technology, I found it surprising that President Bush has declared his intention to deploy a nation-wide missile defense this year. Given our mounting budget deficit, the threats to United States national security interests around the world and the numerous problems facing our military such as aging helicopters, aircraft with high accident rates, and a lack of bullet proof vests, the Administration's decision to seek $10.2 billion for a largely untested and unproven missile defense program raises serious concerns.

While we no longer fear the threat of all-out nuclear war, the likelihood that America will be attacked with a nuclear, chemical, or biological weapon has increased. The proliferation of weapons of mass destruction, and the increasing availability to other nations as well as transnational groups such as terrorist organizations, to the technology and material necessary to develop and deliver WMD is perhaps the most serious threat to U.S. national security today.

We need to spend our resources wisely to make sure that we can protect our nation from these threats. But the odds that terrorists or non-state actors will use ballistics missiles to attack the United States in this manner remains, in my estimation, relatively low. Missile defense would have done nothing to stop 9/11. And missile defense would do nothing to stop a bomb smuggled into this country on a container ship or through another "soft" point of entry.

National Missile Defense is not and should not be seen as a one-size-fits-all substitute for an effective non-proliferation strategy. The United States must have a

balanced program to effectively safeguard our interests and clearly calibrate and allocate resources to meet the real challenges that face U.S. national security interests including providing for effective strategies for non-proliferation activities, deterrence, homeland defense, and counter-proliferation.

I believe it would be folly and far too costly to place too much of an emphasis on missile defense and to unilaterally develop and deploy NMD before we even know what defensive systems are feasible. And likewise I am greatly concerned that even as we spend large sums on missile defense, we are not doing enough to make sure that resources are allocated to such areas as port security. We simply cannot afford to gamble with a national security strategy based on cultivating a missile defense system of unknown effectiveness on one hand with a less stable and less secure world on the other.

SYSTEM READINESS AND A RUSH TO DEPLOYMENT—WHY?

Senator FEINSTEIN. I am still puzzled, well, I was puzzled last year and I'm still puzzled this year by the rush to deploy this system. In March, on the 11th, Senator Jack Reed asked this question. At this time we cannot be sure that the actual system would work against a real North Korean missile threat. And Tom Christie, the director of the Pentagon's Office of Operational Tests and Evaluation, replied, I would say that's true. There are enormous technical difficulties with deployment. The booster rocket has suffered problems; the ground-based X-band radar, needed to enhance satellite tracking, isn't scheduled to be fielded anytime soon; the sea-based X-band radar is not scheduled to be fielded until 2005; the infrared satellite system, which discriminates warheads from decoys and helps guide the interceptor won't be in place for many years, and the system can't deal with decoys and countermeasures, as I understand the reports. And yet it's going to be deployed. My question is why?

General KADISH. Senator Feinstein, I guess I'd like to go back and address specifically those things that you pointed out as being apparent deficiencies.

Senator FEINSTEIN. Good.

General KADISH. And I use the word "apparent" because I'm not sure that we have the right description of the problems that we're facing. When we say we cannot be sure that we would be able to destroy the warheads, I don't think in any of the procurements that I've done in the DOD that were 100 percent sure of anything. So if 100 percent sure is the standard we're not going to meet it so we might as well stipulate that at the beginning. However, where we do not have missile defense capability today against long-range missiles and that's been for 40 years or more now, if we have greater than zero chance, and I mean substantially greater than zero, I'm not going to tell you exactly what we think it is right now.

Senator FEINSTEIN. Is it over 50 percent?

General KADISH. I think that—I'd rather not get into the percentage but we have very high odds of engaging and successfully destroying the threats that we think we're going after right now.

Now, in the case of the booster and the kill-vehicles and the technical challenges, I think you're absolutely right. I mean, 4 years ago, almost 5 now, I began testifying in front of this committee saying that fiscal year 2005 was the earliest we were going to be able to do anything along these lines. And I think that has turned out to be true right now. So it's not like we, over the last year or two or three this is a rush to a particular effort. When we were doing

the old National Missile Defense (NMD) program, we were saying that fiscal year 2005 was probably the earliest, with some risk. We have reduced that risk tremendously and we believe we're going to make fiscal year 2005 in the process.

Now, we set internal dates, September that you hear about from time to time, but those are MDA dates, they're not mandated or dates ascertained by the Department of Defense. So, we believe that the sensors that we have on orbit today, the Defense Support Program, the radars that we intend with Cobra Dane and Fylingdales and then the addition of the X-band radar later on will give us the sensors we need. The booster, the kill vehicle, they're coming along and we should be flight testing them over the next few months to prove out our modeling and simulation.

So, things are going all in the right direction. And I guess the best way to characterize the effort, in terms of its performance, may sound a little trite, but if someone shoots at us we're going to be able to shoot back, whereas we couldn't do that today.

Senator FEINSTEIN. Even if we don't hit anything?

General KADISH. There's a good chance we're going to hit it and we can come talk to you about that in some detail and more classified setting. And if I was on the other side right now I'd be very worried whether or not the systems that they are producing would work against our system. And we're going to only make it better after that. The idea that the radar comes in in 2005, we've got other plans for further activities as we test and make it better that, over time, the countermeasure issues and the things that we're dealing with, we're going to be very good at.

COST JUSTIFICATION OF A BMDS

Senator FEINSTEIN. One last question. Because you've been very straight with us and I really appreciate that. I think you're really a class act. I just want you to know that. I mean, this is so much money, $10.2 billion a year for what, 7 years? That's a lot of money to deploy a system that really hasn't been really tested in its complete form and at a time when our best case for war is asymmetric and non-State and not likely to be waged with Intercontinental Ballistic Missile (ICBMs) but with something coming in in a container. Do you really think, in view of what the next 10 years looks like, that a ballistic missile system is the best way to spend our money in terms of guaranteeing the safety of our people?

General KADISH. Well, I can give you a personal opinion on that issue; it has two parts to it. The first is that, from where I've sat for a number of years, it is a very difficult job to know what's likely and unlikely and what our adversaries are going to do to defeat us. And we make those judgements but we've got to do it with the idea that there's risk involved. And I had the unfortunate experience on September 11, sitting in my office in the Missile Defense Agency, watching the Pentagon burn as a result of the airlines. And, you know, I know there's a big debate over whether folks could have anticipated that or not, but the likelihood equations of one thing over another is a very risky business for us to determine in the Missile Defense Agency. But there's one thing I do know, and that is we have no missile defense capability except for Patriot today against short-range missiles. And that didn't happen except with

the support of this committee for many years, and we struggled with that effort. We had some failures; it was a difficult technology but it worked very well in the last war. And we're building up. And I believe that the same will occur with the systems that we're talking about at Fort Greely and Vandenberg, Aegis and THAAD and the ones that we're building. Because that $10 billion is not only for the ground-based program effort at Fort Greely and Vandenberg this year, it's for airborne laser, the THAAD program, the Aegis program and the radars that support all that. So it's very expensive but it's also very comprehensive and complex.

I don't know if that helped in terms of the answer but it's a tough business for us to say, in the missile defense business anyway, that we ought to choose to leave ourselves vulnerable to missiles anymore now that we can do something about it.

Senator FEINSTEIN. Thanks, General. And I'd appreciate that briefing. Thank you very much.

General KADISH. Thank you.

Senator FEINSTEIN. Thank you, Mr. Chairman.

Senator STEVENS. Senator Dorgan.

DEVELOPMENT OF BMDS WITHOUT ADEQUATE TESTING

Senator DORGAN. Mr. Chairman, thank you very much. I share some of the same concerns expressed by my colleague from California. Most of the significant new weapons programs that we've been discussing with the Department of Defense I support. I think they are important for this country and for its defense. But the Senator from California asked questions that I think need to be asked. Are we rushing to deploy a system that has not been adequately tested, that has not been subject to the same rigorous testing strategies that other weapons programs have been required to meet? And, you know, there's so much, with respect to the more urgent, immediate threats that we know exist, there is so much as yet undone because we can't afford it. The question I think the Senator from California poses is in the rear view mirror of 5 years, will we look back and say we would have better used that $10 plus billion in another area for a more urgent threat? I think the answer probably will be yes, but none of us know for sure.

Let me ask the question. You talked about the booster and the kill vehicle and in answer to the question posed by my colleague from California, no one can be 100 percent sure. I understand that and no one is asking, with respect to any of these systems, that we are 100 percent sure. But will this system be deployed without the same kind of rigorous testing that is applied to other systems? Because we are rushing here to deploy it, as you know.

CONCURRENT TESTING

General KADISH. Well Senator Dorgan, I guess I would characterize what we're trying to do here as not a rush to deployment. What it is is building the system so we can test it in its operational configuration and since we've done that it has the capability to defend the country so we will use it in that role simultaneously, or concurrently. So one of the things I have to point out, and I have a very hard time explaining this because it gets to be very technical in terms of the rules that we use within the Department, but

let me try it this way. When we do operational testing, what that means is we want the people who are going to use it to push the buttons and do all the things that we need to do so that in an operational environment, day to day, we can be sure it works. And you might want to ask the question, well, why do we do that? Well, 99 percent of the time we do that because we're replacing another system, and what we want to do is make sure good management practice is that what we're replacing, the system that we're replacing something with can work better or at least as good as, in the operational environment, after having spent a lot of money. So these things usually occur after a very long development cycle. We do an operational test, we check some boxes, make sure that things work better than what we have in the field and we move on. In the case of missile defense, we don't have a system in the field today against long-range missiles. So we have to build it in order to test it in its operational configuration. We get criticized a lot about not having the radars in the right spot and that type of thing. I can go on at length, but the simple answer to that is we need to build it to test it in its operational configuration and therefore we can actually use it as well.

Senator DORGAN. Well, building it and deploying are different circumstances, but General Kadish, the only anti-ballistic missile program that has ever been deployed was deployed in my State back in the early 1970s and was moth balled almost immediately, I believe within 30 days after being declared operational, for a number of reasons.

RUSH TO DEPLOY OR POSTPONE?

But I have received a letter that was sent around on this program from 49 generals and admirals who call for postponing missile defense. They say the Pentagon has waived the operational testing requirements essential to determine whether the highly complex system is effective and suitable, and they make the case that this money, the billions of dollars, should be spent on other defensive systems, which are more urgent.

If I might just make the case, I think there is a threat of nuclear weapons against this country. I think the least likely threat, by the way, is from an intercontinental ballistic missile. Perhaps the most likely threat is from a suitcase nuclear weapon in a rusty car on a dock in New York City. But if you take the threat meter, which many of us have seen, regarding what are the likely threats against this country, the threat of a nuclear-tipped intercontinental ballistic missile is perhaps the least likely of those threats. It would be deadly, were we attacked by someone with such a weapon. But such an attack is deterred because we, of course, know the return address of the missile, and whoever attacks us will be vaporized quickly. I mean, I think the question that the Senator from California asked is a critical one; is this the most urgent defensive system for which we should be spending $10 billion at this point, and I don't think any of us know the answer to this. My own impression, I just might say, is that we are rushing to deploy a system that is costing a great deal of money and one which we do not know whether it will work. And I'm concerned about that because there are so many other things as yet undone.

Let me add, however, my compliments to your service, General Kadish. I've been in briefings that you've been involved in for many years; you served this country with great distinction. I know you care about this program and nurture this program with great skill and professionalism; I want to say that and thank you very much, General, for your service.

General KADISH. Thank you, Senator Dorgan.

Senator STEVENS. General, are we about ready to wind this up?

General KADISH. I'm fine, Senator.

Senator STEVENS. Are you? All right.

I will submit my questions.

Senator, do you have any further questions?

Senator SHELBY. Let me be brief if I can. I know we need to let General Kadish go.

General KADISH. Yes sir.

SYSTEM TEST AND EVALUATION PLANNING ANALYSIS

Senator SHELBY. General, you might want to answer these questions for the record, that would be fine. That is, I've been impressed with the systems test and evaluation planning analysis lab. How will system-integrated flight testing help meet the architecture integration challenge in the future? How rigorous will this testing be? Do you want to answer that for the record?

General KADISH. It will become more and more rigorous, without a doubt. I think that if we—I'd like to take the specifics of the systems tests analysis lab for the record.

Senator SHELBY. Absolutely.

[The information follows:]

The System Test and Evaluation Planning Analysis Lab (STEPAL) is the Missile Defense Agency's choice for in-depth analyses and credible flight test planning. We currently use STEPAL resources to perform vigorous pre-mission analysis that includes supportability, evaluation of test requirements, flight safety, and other factors necessary for the successful execution of integrated Ballistic Missile Defense System (BMDS) test scenarios. The support provided by the STEPAL has provided MDA with a quick look capability that allows us to observe additional important mission aspects such as safety, debris effects; telemetry coverage; as well as the adequacy of test range assets.

General KADISH. But I'd like to point out that because we're able to build it like we are, calendar year 2005 is going to be a very, very interesting year in missile defense from a test standpoint because we'll be able to do an awful lot of flight testing and ground testing that we haven't been able to do before.

SCIENTIFIC, ENGINEERING AND TECHNICAL ASSISTANCE (SETA) CONTRACTORS

Senator SHELBY. General, for the record, would you give us your views on the importance of SETA contractor support and how valuable their contributions have been to MDA?

General KADISH. The SETA contractors, the support engineering? It's been invaluable to MDA from across the country, especially from the State of Alabama and Huntsville, which is a major center for missile defense. But we couldn't do it without the talented people that we have across the country, especially the SETA contractors, the prime industrial partners and the Federally Funded Research and Development Center (FFRDCs) and folks.

Senator SHELBY. You made some cuts there. Is that wise? I know you're constrained by your budget from time to time. Will you address that some?

General KADISH. Well, what we've been doing is trying to balance out the skills that we need at any given time. And that can look like a cut in certain areas but basically we're trying to balance the skills that we need in the process.

ADVANCED TECHNOLOGY FUNDING

Senator SHELBY. General, advanced technology funding; I think you've got to invest for the future. You know, some people, and I at times ask about money, and we're spending a lot of money but if we don't spend for the future we'll be shortchanged, I believe. Development funding for sensor improvement, better software, faster communication systems, improved propulsion systems, lighter and strong structures, better thermal control, enhanced signature discrimination, decoy concepts and detection techniques are vital to all of us and for this program. Does MDA have an adequate technology development budget to support spiral development here or will you need more money?

General KADISH. Well, I think that we can get the specifics for you for the record but overall I'm satisfied with where we are on the deep technology activities. Because when I look at what's happening in the THAAD program and the GMD program and the other efforts that we have, we're doing an awful lot of that work in the application of technology right now. And it's a tough balance but I think the balance is right, right now.

SPACE AND MISSILE DEFENSE COMMAND (SMDC) AND MDA RELATIONSHIP

Senator SHELBY. General, lastly, I'm just going to touch on the relationship between SMDC and MDA. You can do this for the record. What are your thoughts on this relationship and the importance of SMDC to supporting MDA's mission?

General KADISH. I can expand for the record but the bottom line, Senator, is that it's a great relationship now, and we have people working together on some very tough problems.

[The information follows:]

The relationship between MDA and SMDC is strong. The success of my organization is dependent on the technology support that SMDC provides. As the Army's proponent for the Ground-based Midcourse Defense (GMD) System and operational integrator for global missile defense, the Army's Space and Missile Defense Command (SMDC) plays a key role in supporting MDA to develop, field, and test a fully integrated and operational Ballistic Missile Defense System (BMDS) capability for the nation. SMDC is a strong and effective advocate for global missile defense and works closely with MDA to ensure our national goals of developing, testing and deploying an integrated missile defense system are met. SMDC conducts research and develops and matures new and emerging technologies to enable missile defense capabilities. SMDC's Reagan Test Facility on Kwajalein Atoll supports missile defense testing. SMDC participates in deploying and operating the GMD System, including oversight of GMD Brigade and subordinate GMD Battalion operations. SMDC also works closely with MDA to focus attention on improving Theater Air and Missile Defense (TAMD) Systems. The long legacy and continuing research and development by SMDC in the missile defense arena has made possible the recently fielded missile defense systems and will provide the means for future enhancements and new weapon systems.

Senator SHELBY. Thank you. Mr. Chairman, thank you for your indulgence. General, I hope you feel a little better today.

General KADISH. Thank you, Senator.

Senator STEVENS. Mr. Cochran.

Senator COCHRAN. Mr. Chairman, I have other questions that I'll be happy to submit, particularly one relating to the capability for Aegis destroyers and cruisers to play an active role in missile defense and what your plans are for coordinating the operations with the Navy and helping to offset costs associated with these modifications and other questions as well. I'd be happy to submit those, Mr. Chairman, and express our appreciation for the continued good work of General Kadish.

Senator STEVENS. General, I think that Senator Inouye and I have been privileged to spend probably more time with you than other members of this committee and we thank you for the time you've spent with us to keep us posted on the developments. I have a series of questions that I would like to send to you for the record.

Senator SHELBY. Mr. Chairman, could I just mention, we have a Major General sitting behind General Kadish, General Obering, here today, and I think we'll probably see more of him in the future, will we not, General Kadish?

General KADISH. Yes sir, he's been nominated to the Senate to replace me and he's a great guy.

Senator SHELBY. And Mr. Chairman, he's from Birmingham, Alabama, it just happened to happen that way.

ADDITIONAL COMMITTEE QUESTIONS

Senator STEVENS. Well, since he wasn't from Alaska I didn't introduce him but I knew he was there. Thank you.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED BY SENATOR TED STEVENS

GROUND-BASED MISSILE DEFENSE PROGRAM

Question. General Kadish, can you assure the Committee that the Missile Defense Agency will continue to improve the ground-based missile defense system? I am concerned about technical obsolescence of the program—technology will continue to move forward—how will you deal with this?

Answer. The Ground-Based Midcourse Defense (GMD) program will continue to improve well beyond the Initial Defense Capability that is being fielded this year. We are planning upgrades to the current system, and our upcoming budget submissions will include funding for these upgrades. For example, the processor on the Exoatmospheric Kill Vehicle (EKV) will be upgraded to avoid obsolescence. This upgrade will be ready to be included in Ground Based Interceptors that are scheduled for fielding in the 2006–2007 timeframe. We are also planning upgrades to the GMD Fire Control (GFC) system as additional sensors are fielded. We have several programs to develop software upgrades to provide more advanced discrimination capability, and our testing will become increasingly more challenging to validate our progress in this area.

Question. Once this program is fully fielded in Alaska and at Vanderburg Air Force Base over the next several years, how will you use the concepts of spiral development and block upgrades to improve the program five years from now?

Answer. The program for spiral upgrades to the GMD components of the Initial Defensive Capability include an enhanced EKV (an upgrade to the processor), additional GMD Fire Control capability as a result of additional sensor capability such as the Sea-Based X-Band Radar (SBX), a program to mitigate potential counter-

measures, multi-sensor fusion improvements, and advanced discrimination capabilities. All of these efforts are currently programmed within the FYDP.

AIRBORNE LASER PROGRAM

Question. General Kadish, the airborne laser program was restructured earlier this year. Please explain some of the progress that has been made on this program and some of the remaining technological challenges?

Answer. The Airborne Laser (ABL) program has made significant technical progress to date. We have successfully modified and conducted initial flight-testing of the Boeing 747–400F which will accommodate the lasers and optical control systems. We have completed the manufacturing, optical coating, and end-to-end testing of the beam control system and have begun integration of this system into the aircraft. The six-module high power laser has been fully installed in the System Integration Laboratory (SIL) at Edwards AFB and is currently undergoing initial testing. Finally, we have successfully demonstrated our capability to safely mix and handle the chemical laser fuel and we are making steady progress towards the first firing of the high power laser.

The program was restructured to improve the focus on two near term efforts that will give us a better indication of the ABL's viability: (1) first flight of the beam control system during late 4th qtr CY 2004 and (2) first light of the six-module high power laser in the Systems Integration Laboratory (SIL), during December 2004.

Apart from these two milestones, there are a few other remaining technological objectives for the ABL program, to include integration of the turret ball on the front of the aircraft, integration of the target acquisition/tracking lasers onboard, and finally demonstration of the entire system with the shoot down of a ballistic missile. These technological objectives are significant, but at present we do not foresee any showstoppers.

Question. I note that the 2005 budget reflects this restructuring. Are you concerned about losing momentum in the program and that we have a clear way ahead on directed energy programs?

Answer. It is true that the technical challenges we are working to resolve have delayed fielding the first ABL aircraft and that the restructure has delayed acquisition of the second aircraft. However, we will maintain program momentum by resolving the pacing technical challenges and achieving laser "first light." The record of technical achievement by ABL is cause for confidence that we will solve these challenges. Only decreased funding could cause a loss of momentum at this time. Funding stability will be critical for resolving the remaining technical challenges and moving forward with fielding this capability.

FORT GREELY MISSILE DEFENSE FACILITIES

Question. General Kadish, could you explain the importance of the 2005 budget request to the ground-based midcourse system? What would be the consequences to the Fort Greely program and the overall system effectiveness if this funding is not provided?

Answer. Fiscal year 2005 funding is essential to continue development of the Ground-based Midcourse Defense (GMD) capability and to put the Ballistic Missile Defense System on alert. Decreased funding would impact development and procurement of hardware necessary for the GMD element of the Ballistic Missile Defense System, including procurement of additional ground-based interceptors (GBIs), the Sea-Based X-Band radar (SBX), and upgrades to existing Early Warning Radars. Testing of new systems would be impacted. A funding decrease could cause a break in production and cause distress in the industrial base, potentially forcing the smaller vendors out of business. The time and cost to develop and qualify a new vendor base would be prohibitive.

Decreased fiscal year 2005 funds would also impact our ability to sustain the Initial Defensive Capability. Included in the fiscal year 2005 budget is funding for the Sustainment Development Program. The Sustainment Development Program pays for spares and technical support from the GMD prime contractor. Without this effort the existing GMD hardware cannot be maintained.

Question. Please provide us a status report on how the construction at Fort Greely is proceeding?

Answer. The following is a look at some of the wide variety of GMD facilities at Fort Greely that will support IDO, and their status for alert.

—Six Fort Greely silos complete;

—Alaska fiber optic ring complete;

—Battalion Fire Control Node at Fort Greely: tested satisfactorily;

—SATCOM links (nine total): tested satisfactorily;

—Fort Greely In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT) complete and tested satisfactorily;
—Fort Greely buildings: 10 complete; five on schedule; one behind schedule (no impact).

Question. Are there any significant issues as you deploy an initial operating missile defense capability later this year?

Answer. There are no significant issues, but challenges remain. Our schedule to begin Initial Defensive Operations is aggressive and depends on many interdependent activities proceeding as expected. We are attempting to remain as agile as possible to account for unforeseen events. Additionally, the outcome our flight tests this year will be important. Overall, however, we expect to remain on schedule.

QUESTIONS SUBMITTED BY SENATOR THAD COCHRAN

Question. General, I understand Aegis destroyers and cruisers will play a key role in the missile defense of the United States and our allies. Could you summarize the capability to be fielded by the Navy and tell us how you coordinate operations with the Navy and help offset their costs?

Answer. The Aegis BMD element of the Ballistic Missile Defense System (BMDS) builds upon the mature, operationally-proven, globally deployed Aegis Combat System (ACS) to detect, track, intercept, and destroy Short Range Ballistic Missiles (SRBMs) to Intermediate Range Ballistic Missiles (IRBMs) in the midcourse (spanning ascent to early terminal) phase of flight while deployed in defense of the nation, deployed U.S. forces, friends, and allies.

The heart of the Aegis BMD system is the Aegis Weapon System (AWS), including the AN/SPY–1 radar. The AWS detects, tracks, and identifies the ballistic missile target, and guides the SM–3 close enough to the target for the SM–3's Kinetic Warhead (KW) to close for intercept. The KW tracks the target with its Long Wavelength Infrared seeker and uses its propulsion system to divert to complete a hit-to-kill intercept. A total of three Aegis Cruisers (CGs) and 15 Aegis Destroyers (DDGs) will be Aegis BMD capable by the end of CY 2006.

Aegis BMD will evolve through spirally developed block improvements as part of the MDA's block upgrade strategy. Block 2004 will be a spiral development, with the Initial Defensive Capability (IDC) (Aegis BMD 3.0E) completed, verified, and tested for Initial Defensive Operations (IDO). This capability will provide long-range surveillance, detection, and tracking of long range ballistic missiles in support of the BMDS. It will be fielded initially on two Aegis destroyers by September 30, 2004, quickly expanding to four DDGs before the end of calendar year 2004.

The test bed version of the engagement capability (Aegis BMD 3.0 plus SM–3 Block I) will be available for ship installation by December 2004 and flight tested in early CY 2005. This capability is not intended for operational employment, but could be available for emergency use. There will be five SM–3 Block I missiles available by December 2004 and BMD 3.0 will be installed on two Cruisers in CY 2005.

The final Block 2004 capability (Aegis BMD 3.1 plus SM–3 Block IA) will be delivered in December 2005 and certified by April 2006 for Fleet use against SRBMs and MRBMs, as well as contingency to provide Long Range Surveillance and Track (LRS&T) data to the BMDS. This configuration also includes the integration of basic Anti-Air Warfare (AAW) self-defense that will be installed in three Cruisers and up to 15 Destroyers by the end of Block 2006. Installation schedules are based on ship deployment and maintenance schedules

The Aegis BMD element builds upon the existing Aegis Weapon System (AWS) and STANDARD Missile infrastructure already deployed in Aegis TICONDEROGA class Cruisers, ARLEIGH BURKE class Destroyers, and Japan's KONGO class Destroyers.

MDA is funding the development, integration, and testing of Aegis BMD upgrades to the existing STANDARD Missile, AWS, and command and control systems. MDA funding also covers the cost of BMD specific ship equipment sets, initial installation, missile purchases, establishing integrated logistics support (ILS), including initial training and spare parts, and developmental flight tests. MDA continues technical and logistic support until six months after the delivery of the block, when sustaining funding responsibility transfers to the Navy, and MDA pursues the next block upgrade. The Navy pays for ship operations and support (O&S) costs and Manpower and Personnel (MPN) costs for the crews throughout development and operational phases.

For developmental tests, Aegis BMD coordinates closely with Commander, Third Fleet (C3F) to assign ships to test events, particularly USS LAKE ERIE, the as-

signed BMDS test ship. C3F also provides Destroyers to participate in test events, as appropriate. MDA funds marginal costs for these test events, such as fuel.

Operational employment of the ships in support of BMDS will be under the Commander, Pacific Fleet (CPF), in coordination with NORTHCOM and STRATCOM. CPF will fund the marginal costs for ship operations. This approach fully leverages the U.S. investment in the Aegis fleet to provide an affordable missile defense capability.

Question. General, I see that you have requested funding for boost phase development for the Kinetic Energy Interceptor. With the next generation Navy Cruiser, the CG(X), in the early planning stages, I am interested to know what discussions you are having with the Navy for sea-basing options for this interceptor and what would be the fielding timeframe?

Answer. The KEI program office commissioned the Navy to conduct a CONOPS study to determine what interim platforms are feasible for the KEI mission until the CG(X) is fielded. The results of the study may be available as soon as September 2004. The projected fielding timeframe for sea-based KEI is in Block 2012 on an interim platform. The Navy CG(X) will be ready for fielding around 2020. The Navy can provide more specific dates for the CG(X) fielding.

Question. General, I understand that there is an industry proposal, supported by our Japanese allies, to develop a sea-based interceptor that would fit in existing Navy missile launchers. Given the Administration's desire to involve the international community in missile defense and the fact that this proposed missile would not involve modifying existing ships, what is your opinion of spiral developing the SM–3 missile to a 21 inch missile instead of using the 36 inch Kinetic Energy Interceptor?

Answer. The Missile Defense Agency (MDA) has initiated a comprehensive Joint Analysis with Japan to evaluate future ballistic missile defense options for the defense of Japan and the United States. This analysis will allow Japan and the United States to make informed decisions regarding the development, production, deployment and enhancement of interoperable missile defenses. Enhancements to the SM–3 will be addressed as part of the Joint Analysis.

Question. General Kadish, in your statement you indicate you have experienced some difficulties with the Airborne Laser as that system has moved from the drawing board to actual flyable hardware. For example, I have been informed the aircraft is somewhat heavier than had been hoped and that the testing of the system has faced numerous delays. Would you characterize the challenges you've encountered as something expected for a program of this sort or are they what some might call "showstoppers?"

Answer. The challenges we have faced to date are typical for a program of this nature, which is the first of its kind. However, we have encountered nothing to date, which we would categorize as a showstopper. In fact, you could say we have achieved some unique successes since beginning the development of the ABL to include work in the areas of chemical and solid-state lasers, precision optics, and even aircraft design and modification. Given the advanced nature of the technology we are using to produce the ABL, we have really made tremendous progress. Furthermore, I am confident that we can complete the remaining technical requirements in order to successfully demonstrate this system.

Question. General Kadish, I understand the Terminal High Altitude Air Defense (THAAD) radar was completed ahead of schedule and delivered last month and the THAAD program is scheduled to have its first flight test late this year. However, I am told that it will not achieve operational capability for several years. General, how would you assess the program's risk at this point, and is there anything that can be done to move this program along a little faster?

Answer. The overall program risk assessment for the THAAD program is moderate. For the first flight (December 2004), the missile component has moderate technical and schedule risks. For the first intercept (June 2005), the launcher component has moderate schedule risk. All risks will be retired by ground testing prior to first flight and intercept, with the exception of schedule risk for a production booster motor and thrust vector assembly source.

The recent incidents at the boost motor supplier (Pratt & Whitney) have put enormous pressure on the fiscal year 2004/fiscal year 2005 program. The additional cost to recover from these incidents and bring on an alternate boost motor supplier is projected to be $120 million through fiscal year 2007. This has resulted in a significant deferral of activities out of fiscal year 2004 into later years, with an immediate impact of $95 million in fiscal year 2005 ($45 million to recover the necessary deferred activities and $50 million for the boost motor supplier alternate source issues).

The current THAAD program includes the first Fire Unit for which fabrication will begin in fiscal year 2007, with delivery for operational assessments and potential deployment scheduled for mid-fiscal year 2009. The Fire Unit cost is $483 million, with a current funding plan for Fielding based on $360 million in fiscal year 2007 and $123 million in fiscal year 2008. There are three options for accelerating the availability of this equipment.

Option 1: To accelerate the Fire Unit by six months, the current approved $483 million for THAAD fielding would be required to start in fiscal year 2006 (vice fiscal year 2007). This includes $75 million in fiscal year 2006 for radar long lead items, with the additional $309 million is fiscal year 2007, and $99 million in fiscal year 2008. This is a low risk option that moves the Fire Unit availability from mid-fiscal year 2009 to late-fiscal year 2008.

Option 2: To accelerate the Fire Unit by 12 months, the current approved $483 million for THAAD fielding would be required to start in fiscal year 2006 (vice fiscal year 2007). This option would move the $360 million from fiscal year 2007 to fiscal year 2006 and the $123 million in fiscal year 2008 to fiscal year 2007. This is a low risk option that moves the Fire Unit availability from fiscal year 2009 to fiscal year 2008.

Option 3: To accelerate the Fire Unit by 18 months, the current approved $483 million for THAAD fielding would be required to start in fiscal year 2005 (vice fiscal year 2007). This includes $75 million for radar long lead items, with the additional $360 million in fiscal year 2006, and $48 million in fiscal year 2007. This is a more aggressive option that increases risk and requires an early decision on the purchase of hardware prior to an intercept flight test. It moves the Fire Unit availability from fiscal year 2009 to fiscal year 2007.

QUESTIONS SUBMITTED BY SENATOR DANIEL K. INOUYE

Question. General Kadish, the Missile Defense Agency plans include funding for 10 ground-based interceptors at a third missile site overseas. What is the benefit of having an additional site overseas, and what are the candidate countries that you are looking at to house this site? Do you expect that there will be international contributions for a third ground-based intercept site, or will the United States have to assume the entire bill?

Answer. We have included funding in fiscal year 2005 for long-lead items for an additional 10 GBIs that could be deployed at a potential third site, or at Fort Greely. No determination has been made as to the actual location of this third site. In our analysis we have examined potential third sites in the United States as well as overseas. The benefit of an overseas site is that it provides additional protection to the United States as well as protection to our allies and friends. Several overseas regions, including Europe, are potential candidates for a GBI site from a performance perspective. There are, however, many other factors that would determine whether a particular site is viable. If a determination was made that an overseas site is desirable, in addition to the many domestic considerations, we would expect the nature of non-U.S. contributions to factor into a final decision.

Question. General Kadish, your budget request includes nearly $80 million for space-based weapons-related research and development. $68 million of the request is for launching a short-range kill vehicle into space for the Near-Field Infrared (N-FIRE) program. What is the goal for the "N-Fire" program, and could you use alternatives to a kill vehicle in space to collect data for this program?

Answer. The Near Field Infrared Experiment (NFIRE) is a major risk reduction project for the Kinetic Energy Interceptor (KEI) program. The primary NFIRE objectives are: Collection of near field rocket plume and rocket hardbody IR data for model validation and algorithm verification; and near term KEI kill vehicle development and testing (hardware and software).

Yes there are other methods to collect IR data however NFIRE is the only method that will provide near field IR data.

Aircraft observations using a variety of sensors allow us to collect IR data at aircraft altitude and speed, but do not provide the near field resolution we need because the distance to the target is typically 150–250Km. Range safety prohibits aircraft from getting closer than that.

Sub orbital tests, simultaneously launching a one use sensor and a target, require both rockets to fly to the same point time in space. This approach is a one shot opportunity with a specific sensor.

An orbital based test, like NFIRE, uses the highly predictable nature of a satellite to reduce the risk for both objects to arrive at the same point time in space. An

orbital platform allows us to have multiple opportunities to collect near field data in various wavebands at a variety of engagement ranges and geometries.

Question. I understand that the reason the kill vehicle portion of the Near-Field Infrared Experiment is not considered a space weapon is that it is restricted from moving forward or backward. How difficult is it to put this forward-backward movement back into the kill vehicle?

Answer. Including an axial stage (forward-backward movement) was never part of the NFIRE kill vehicle. Consequently, to add an axial stage to the current NFIRE kill vehicle would require a redesign of all portions of the experiment (satellite, KV, launch vehicle, ground support). This redesign would be difficult, costly, negatively affect the schedule, and prevent our delivery of near field rocket plume and rocket hardbody IR data in time to reduce the risk to Block 10 KEI kill vehicle development.

Adding an axial stage to the kill vehicle does not contribute to the primary NFIRE objectives: Collection of near field rocket plume and rocket hardbody IR data for model validation and algorithm verification; and near term KEI kill vehicle development and testing (hardware and software).

SUBCOMMITTEE RECESS

Senator STEVENS. But continuing on, we hope that you will feel free to keep in touch with us and be a Monday morning quarterback for us, and we invite you to return to our States and be treated as you should be, as one of our favorite people in military uniform, whether you're wearing the uniform or not. Thank you very much and thank you for continuing on under difficult circumstances, General. But since this is your last meeting here, let me again repeat what I said to you. We congratulate you and thank you on behalf of the people of the United States for your commitment to the system, and your willingness to spend the hours you have spent, long days away from your family, to make certain that it is the best system we can devise today. And I hope it will continue to improve with your guidance. Thank you very much, General.

General KADISH. Thank you, Mr. Chairman.

[Whereupon, at 10:55 a.m., Wednesday, April 21, the subcommittee was recessed, to reconvene at 10 a.m., Wednesday, April 28.]